## ABSTRACT

The present invention pertains to a method for efficiently introducing exogenous genes into stem cells, particularly human stem cells. The method optionally includes the steps of inducing the proliferation of target cells by pre-stimulation with cytokines and/or growth factors, followed by incubating these cells with RD114-pseudotyped vector particles. In a specific embodiment, the vector particles are retronectin-immobilized or ultracentrifugation-concentrated retroviral vector particles pseudotyped with the feline endogenous retrovirus (RD114) envelope protein. The present invention further discloses a method for somatic gene therapy, which can be used for various therapeutic applications and involves introducing a gene of interest contained within the retroviral genome into human repopulating stem cells followed by introducing these cells into a human host. Finally, the present invention discloses a method for monitoring the efficiency of the stem cell-mediated gene transfer based on detecting the presence of the genes (or the expression products) of the retroviral vector in various stem cell-derived lineages of the host.